Too Many Languages in the ALPPS

Linecker, Michael ; Kron, Philipp ; Lang, Hauke ; de Santibañes, Eduardo ; Clavien, Pierre-Alain

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Too Many Languages in the ALPPS

Preventing Another Tower of Babel?

Michael Linecker, MD, Philipp Kron, MD,* Hauke Lang, MD, FACS,†*
Eduardo de Santibañes, MD, PhD, FACS (Hon),‡ and Pierre-Alain Clavien, MD, PhD, FACS (Hon)§*

Objectives: To establish a ''consensus'' terminology of many variants of the ALPPS procedure.

Backround: The rapid development and dissemination of ALPPS with the availability of many variants has led to numerous neologisms, also leading to confusion and difficulties in comparing various experiences. The first expert meeting in February 2015 in Hamburg concluded that the development of a common terminology of procedures, summarized under the acronym ALPPS, is needed.

Methods: The current literature on ALPPS and the International ALPPS registry, including more than 600 cases, were reviewed to identify all the acronyms related to ALPPS. A logical nomenclature system was proposed by founding members of the registry and subsequently submitted to each center registered in the ALPPS registry (n = 209) to reach a consensus.

Results: The many identified ALPPS terms were classified according to their application (e.g. surgical access such as laparoscopy, transection variants etc.). These variants were subsequently placed in form of prepositions before ALPPS following a defined order: strategy, stage of the procedure, access, portal vein embolization, if used, types of transection and hepatectomy. The principles for the terminology and specific application were eventually commented and approved by each center registered in the registry.

Conclusions: The proposed ''consensus'' terminology should enable to better compare the many variants of ALPPS, and was also designed to implement future developments due to the readily applicable principles.

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One of the main conclusions of the expert meeting in Hamburg was the need to develop a common language to adequately compare and further develop different variants of the original technique of ALPPS.[1] To do so, the founding members (HL, EdS, and P-AC) and coordinator (ML) of the International ALPPS registry prepared a proposal for a ''consensus'' terminology of ALPPS variants on the basis of the current literature, the ALPPS registry, and a survey of the 209 centers registered to the registry.

Consistency and clarity in the terminology used is paramount to secure proper communication and reporting. For example, ALPPS originally was an acronym for Associating Liver Partition and Portal vein ligation for Staged hepatectomy.[2,3] A few groups have subsequently favored portal vein embolization (PVE), rather than portal vein ligation (PVL), after transection, as developed previously by the Strasbourg group for 2-stage hepatectomy.[4] Thereby, we would propose shifting the original meaning for ALPPS from ''ligation'' to ''occlusion,'' and thus the acronym ALPPS would stand now for ''Associating Liver Partition and Portal vein *occlusion* for Staged hepatectomy.'' However, in the absence of a prefix indicating PVE (see later), ALPPS would still refer to PVL, as meant in the original description.[2,3] We first listed the many acronyms used by the authors in the literature and registry, and then the proposition of a new terminology.

METHODS

The ''consensus'' terminology proposal was conducted in 4 steps. First, we searched for all terms used in the registry and literature; second, we established principles to follow when proposing the new terminology, third, consensus terms were proposed by the authors, which were subsequently submitted to each center registered in the registry; finally, we have written this proposal setting out the proposed consensus terms.

Principles of a New ALPPS Terminology

We based the new terminology on 4 principles.

1. Simple and self-explanatory
2. Based on the Brisbane classification of liver anatomy[5]
3. No new acronyms and neologisms
4. Variants are placed in the form of prepositions in a distinct order before ''ALPPS'' starting with the *strategy*, the *stage and access*, *PVE* if used, *transection* and the type of *hepatectomy* (Table 1).

New ALPPS Terminology

The initial phase was to prepare a consensus terminology among the founding members and coordinator of the registry, which was submitted for comments to each representative of the 209 registered centers. The proposal below is the final product after this process.

Failure of PVE With Subsequent ALPPS

Some reports have focused on the failure of PVE to induce hypertrophy of the future liver remnant (FLR), and the use of subsequent ALPPS to boost the expected growth. *Terms used:* Rescue ALPPS, salvage ALPPS.

Our proposal: ALPPS performed because of inadequate hypertrophy after PVE should be labeled: *Rescue ALPPS*.

Minimally Invasive ALPPS Variants

Terms used: Laparoscopic, robotic, and hand-assisted ALPPS.

Our proposal: To keep these terms as they comply with the proposed principles. We would however recommend, indicating the stage of the operation when it is used (ie, first versus second stage).

Examples:

1. Laparoscopic stage 1, but open surgery for stage 2: *Stage 1—laparoscopy ALPPS.*
2. Laparoscopy for both stages 1 and 2: *Stages 1 and 2—laparoscopy ALPPS.*

From the *Swiss HPB and Transplantation Center, Department of Surgery, University Hospital Zurich, Zurich, Switzerland; †Department of General Surgery and Transplantation, University Hospital Mainz, Mainz, Germany; ‡Department of Surgery, Division of HPB Surgery, Liver Transplant Unit, Italian Hospital Buenos Aires, Buenos Aires, Argentina; and §Centre Hépato-Biliaire, Hôpital Paul Brousse, University Paris Sud, Villejuif, France.

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Reprints: Pierre-Alain Clavien, MD, PhD, Department of Surgery, University Hospital Zurich, Raemistrasse 100, CH-8091 Zurich, Switzerland.
E-mail: clavien@access.uzh.ch.

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TABLE 1. Principles for the Terminology Used for ALPPS Variants

Order of Preposition	Example
Strategy	Rescue ALPPS
Stage of the procedure	Stage-1 ALPPS
Access	Robotic ALPPS
Use of PVE rather than ligation	PVE ALPPS
Type of transection	Partial, radiofrequency ALPPS
Type of hepatectomy (= site of transection)	Right trisectionectomy ALPPS

PVE indicates portal vein embolization.

Portal Vein Ligation (PVL) and Portal Vein Embolization (PVE) Variants

Terms used: Hybrid ALPPS, hybrid ALTPS, pre-ALPPS PVE, sequential ALTPS.

Our proposal: The intentional use of PVE as part of the first stage is stated by using PVE-ALPPS. The absence of any preposition would mean portal vein ligation at the first stage, concomitantly with transection. Timing of PVE should of course be disclosed in the respective reports.

Transection (Parenchymal Division) Variants

Terms used: Partial ALPPS, p-ALPPS, complete ALPPS, ALTPS, RALPP, radiofrequency ALPPS, LAPS, microwave ALPPS.

Our proposal: Partial ALPPS is used for incomplete transection lacking an exact definition. Short of better assessment methodologies, the degree of transection relies on the surgeon's intraoperative estimation. The estimate should be disclosed in the methodology of the respective reports.

Various techniques of parenchymal division:
Tourniquet ALPPS
Radiofrequency ALPPS
Microwave ALPPS.

Extent of Hepatectomy

Terms used: Right/left ALPPS, right/left hepatectomy ALPPS, right/left trisectionectomy ALPPS +/− segment 1, right/left trisectorectomy liver split, classical ALPPS, left sided ALPPS, reversal ALPPS, monosegment ALPPS, monosegment FLR ALPPS.

Our proposal:

We propose to strictly adhere to the Brisbane classification[5]
Right (or left) hepatectomy ALPPS
Right (or left) trisectionectomy ALPPS.

Further extending hepatectomy, only sparing a single or adjacent segments, referring terminology to the FLR is much more convenient (eg, *Segment 6 ALPPS* or *Segment 5–6 ALPPS).* This would include unusual types of ALPPS, for example, a case where only segments 4 and 1 would be kept: *Segment 4–1 ALPPS.*

We would conclude this proposal with an example of a case: a patient with colorectal liver metastases in segments IV–VIII and insufficient FLR underwent PVE to achieve curative right trisectionectomy. Unfortunately, the expected hypertrophy failed because of the use of a massive chemotherapy before PVE, and the first stage of ALPPS consisted of a partial laparoscopic parenchymal transection to boost regeneration of the FLR. After a waiting interval of 10 days the FLR showed adequate volume with acceptable liver function, and the patient underwent right trisectionectomy. Combining the proposed terminology this ALPPS variant could be described as follows:

"Rescue-stage 1-laparoscopy-partial-right trisectionectomy ALPPS."

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